APPENDIX G

Instructions for Setting High Water Marks
Source: Iowa Natural Resources Council (now Iowa DNR) 1969

High water marks, when carefully set and the elevation subsequently established, serve many useful purposes in preparing plans for projects that may be affected by flood flows. These notes on the setting of high water marks are intended to guide the reader in setting marks. Information obtainable from high water marks can be useless if the marks are not carefully set and documented. The Iowa Department of Natural Resources (Iowa DNR) may be contacted for information of marks set or assistance in setting new high water marks.

It is desirable to establish high water marks for all floods large enough to cause flooding the bottomlands even if the flood is lower than others that have been recorded. Marks of several floods at the same location are very useful for hydrologic and hydraulic calculation.

Installation of Mark:

INRC Aluminum Discs

Fasten with a scaffolding nail to buildings, trees, fence posts, or other convenient objects, preferably between 2 and 6 feet above ground and out of plain sight whenever possible, to protect them from malicious damage. The top of the nail should be as near as possible to the high water line. The date of the flood crest, if known, may be stamped on the disc with a die set or marked on the disc with a sharp object (month/day/year as 6/22/61).

A photograph of the area showing the location of the disc is helpful if it is located in a remote area.

Painted Lines

On concrete, steel, or rock ledges, where a disc cannot be fastened, a stripe of paint may be used. The lower edge of the painted line should be as near as possible to the high water line.

Location of Flood Marks:

High water marks can usually be set more accurately and more conveniently after the flood crest has passed.

Structures on the floodway or lodging of debris often cause considerable variation of flood heights and care should be exercised to see that the mark truly represents the normal flow condition. Marks influenced by waves, wakes from boats, etc. should be avoided in setting high water marks. A relatively straight portion of the stream is always more desirable then a tortuous section.

Flood waters often leave a line on tree, posts, or other objects. These are often visible for sometime after the flood and may be used for setting flood markers.

Material left in fields or along roadsides often permit a determination of the high water. This level can often be transferred to a convenient marking place by user of a hand level. If this is done, the location of the original mark should be recorded also.

Local residents often observe the depth of water on roads or the extreme edge of the high water. Information of this type can also be transferred to a convenient marking place by use of a hand level. This type of mark should be identified in the notes as being set by a local resident.

Photographs of unusual flood conditions should also be obtained.

Number of Flood Marks:

It is always better to have too many marks rather than too few. Usually one good flood mark per mile of stream (except at bridge sites) will give adequate information for most planning purposes in rural areas. An attempt should be made to keep a high water marks on one side of the flood plain in rural areas. In special study areas, additional marks should be established for comparative purposes.

In urban area, high water marks should be set as close as possible along both banks of the stream. Intervals of one city block between marks would be a reasonable distance to maintain.

Around bridges it is desirable to set numerous high water marks to facilitate future indirect measurements of discharge and an accurate determination of backwater amounts. The following diagram (see Figure 1 below) will aid in the placement of marks at bridge sites.

Photographs of the downstream contraction and the upstream entrance conditions should be obtained if they appear to be unusual. Several marks should also be set near dams, fills, etc.

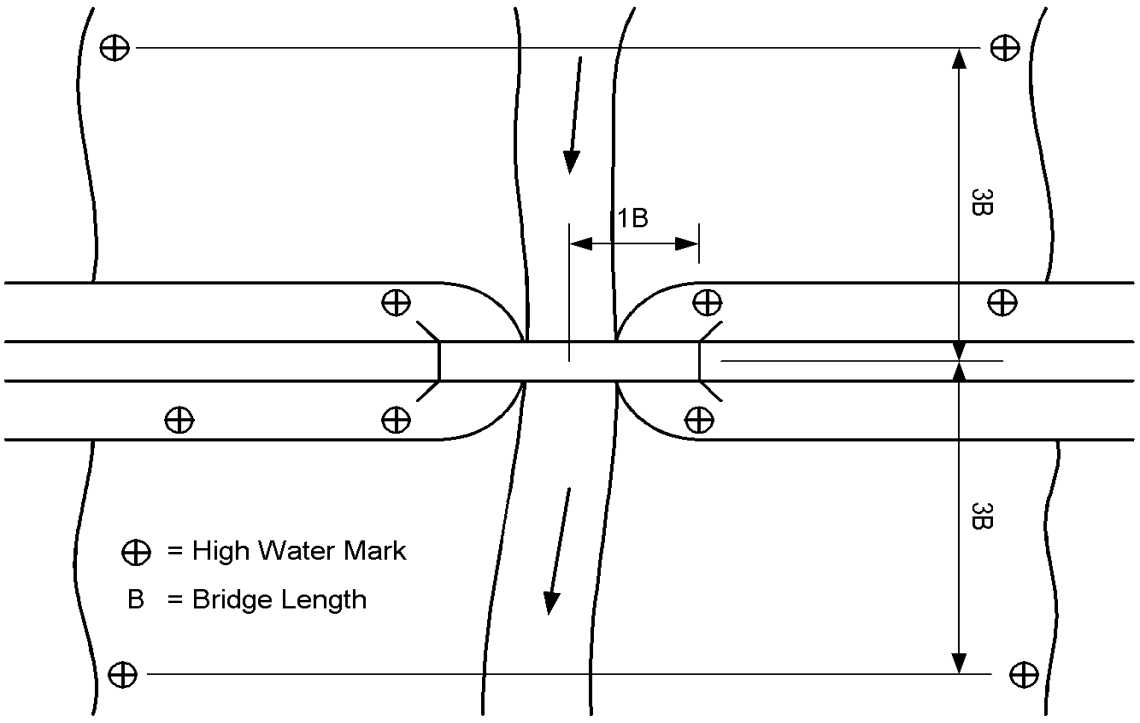

Figure 1 – Typical Locations for High Water Marks

Record of High Water Marks:

The record sheets furnished with the flood marks should be filled out at the time the marker is installed. A High Water Mark Record form is shown on the following page. This form is also available in Microsoft Word fillable format. All items should be completed as follows:

Line 1 - Self explanatory.

Line 2 - Self explanatory, give time of crest if known.

Line 3 - Note side of section as well as number. Example: "N. side Section 12." Township name may be used instead of township and range. If section and township are not known, clearly describe the location. Example: "County Road C-28, 2 miles south of State Highway No. 218."

Line 4 - Description. Give a detailed description. Examples: "Aluminum disc 3.6 feet above ground on south side of 16 foot elm tree," or "150 feet east of bridge and 75 feet south of centerline of road," or "Red painted stripe at northeast corner of bridge on wing wall 2.0 feet above ground." It is very important that all details regarding the location be given.

Line 5 - Self explanatory.

Line 6 - Source of information. Explain how you know the water reached this height. Examples include: "Visible water line on tree", or "Debris lodged along road," or "John Jones, farmer living 1½ miles east, saw water this deep on road."

Line 7 - Elevation. The elevation does not need to be established at the time the flood mark is set. If a survey crew is working in that locality they may find it convenient to establish the mean sea level elevation. If not, it is planned that these elevations can be determined at the time such information is needed. A central file of mark descriptions will be maintained by the Iowa DNR for the use of all interested parties.

Line 8 - Remarks. Other information concerning other floods or peculiarities of this flood is often useful and should be noted on the record sheet.

HIGH WATER MARK RECORD

1. **Name of River or Stream:** _____

2. **Date of flood:** _____ **Date mark was set:** _____ **Time of Crest:** _____ ☐ A.M. ☐ P.M.

3. **Location County:** _____ **Section:** _____ **Township:** _____ **Range:** _____

Other location description:

4. **Description of High Water Mark:**

5. **Set by:**

6. **Source of Information:**

7. **Elevation:** **Set by:** **Date:**

8. **Remarks:**